Determining the influence of high flows of the spawning behavior of chum salmon at Ives Island, 2006

BPA Project 1999003 (Ken Tiffan; U.S. Geological Survey)

This document is a plan for proposed experimental flows from Bonneville Dam to examine the effects of elevated flows on chum salmon spawning behavior at Ives Island. This study is being funded by BPA under project 1999003 and will take place during from November 1 through mid December, 2006.

Background and rationale

In 2005, we conducted experimental flow tests by increasing tailwater elevations from either 11.5 ft to 13.5 ft or from 11.5 ft to 15.5 ft for a period of 8 hours. We measured movement responses of spawning chum salmon with acoustic telemetry and with a DIDSON acoustic camera. Acoustic telemetry data, when analyses are completed, will allow us to determine how far fish moved away from their redds and where they went during elevated flows. The DIDSON enabled us to measure more detailed behavioral changes in spawning behavior and success during flow test, but sample sizes were low. We request experimental flow tests again in 2006 to increase our sample size of fish observed with the DIDSON so we can be more confident of our conclusions. In addition, we will evaluate the incidence of spawning at higher riverbed elevation under different chum escapement in 2006. We plan to increase our sample size of fish observed by using a second DIDSON camera. The coordination of its use will determine the total number of tests requested, which will not exceed 10. For discussion purposes, assume there will be five tests at 13.5 ft and five tests at 15.5 ft. These tests can be scheduled during the day or night, however other ongoing work in the area limits daytime tests to occur only on Wednesdays or the weekend. The most convenient nights for testing are Tuesday or Thursday nights.

Table 1. Proposed ramp rates and times for 2006 flow tests.

Target tailwater	Time	Tailwater elevation
Daytime		
13.5 ft	07:00	Increase from 11.5 to 13.5 ft
	08:00 – 16:00	13.5 ft
	16:00	Decrease from 13.5 ft to 11.5 ft
Nighttime		
13.5 ft	16:00	Increase from 11.5 to 13.5 ft
	17:00	13.5 ft
	01:00	Decrease from 13.5 ft to 11.5 ft
Daytime		
15.5 ft	06:00	Increase from 11.5 to 13.5 ft
	07:00	Increase from 13.5 to 15.5 ft
	08:00 – 16:00	15.5 ft
	16:00	Decrease from 15.5 ft to 13.5 ft
	17:00	Decrease from 13.5 ft to 11.5 ft
Nighttime		
15.5 ft	15:00	Increase from 11.5 to 13.5 ft
	16:00	Increase from 13.5 to 15.5 ft
	17:00 – 01:00	15.5 ft
	01:00	Decrease from 15.5 ft to 13.5 ft

	02:00	Decrease from 13.5 ft to 11.5 ft